

Claims:

1. A process chamber in connection with a circulating fluidized bed reactor for utilizing internal or external circulation of solid material or both in heat transfer purposes, wherein said process chamber is located inside the furnace of the circulating fluidized bed reactor adjacent to at least one of the furnace walls, the interior of said process chamber being provided with heat exchanger means for heat transfer from the solid material to heat transfer medium inside the heat exchanger means, wherein the process chamber comprises a top closed barrier wall forming the roof of the process chamber, and wherein the inlet of the solid material into the process chamber is arranged to the lower part of the wall of the process chamber and the outlet of the solid material out of the process chamber is arranged to the upper part of the wall of the process chamber.
2. A process chamber in connection with a circulating fluidized bed reactor for utilizing internal or external circulation of solid material or both in heat transfer purposes, wherein said process chamber is located inside the furnace of the circulating fluidized bed reactor adjacent to at least one of the furnace walls, the interior of said process chamber being provided with heat exchanger means for heat transfer from the solid material to heat transfer medium inside the heat exchanger means, wherein the process chamber comprises a top closed barrier wall forming the roof of the process chamber, wherein the inlet of the solid material into the process chamber is arranged to the lower part of the wall of the process chamber and the outlet of the solid material out of the process chamber is arranged to the upper part of the wall of the process chamber and wherein prior to the said process chamber in the direction of the flow of said solid material at least one inlet chamber is provided inside the furnace of the circulating fluidized bed reactor for directing the solid material to the inlet of the process chamber.
3. The process chamber of claim 2, wherein said at least one inlet chamber is arranged in vertical direction inside the furnace of the circulating fluidized bed reactor for directing the solid material to the inlet of the process chamber, and wherein the inlet of the inlet chamber

located at the top of the same is open for receiving flow of solid material.

- 5 4. The process chamber of claim 2, wherein the top closed barrier wall is inclined so as to guide the solid material flowing down onto the top closed barrier wall to the inlet of the inlet chamber.
- 10 5. The process chamber of claim 2, wherein the outlet of the external circulation of the solid material is provided at or above the inlet of the inlet chamber.
- 15 6. The process chamber of claim 1, wherein the heat exchanger means are provided in vertical direction between the inlet and the outlet of the process chamber.
- 20 7. The process chamber of claim 2, wherein the process chamber and the inlet chamber are arranged next to each other.
- 25 8. The process chamber of claim 2, wherein adjacent to the same wall of the furnace at least one set of chambers is provided in a manner that an inlet chamber and a process chamber are provided side by side to form the set of chambers.
- 30 9. The process chamber of claim 2, wherein adjacent to the same wall of the furnace at least one set of chambers is provided in a manner that a process chamber is provided on both sides of an inlet chamber, said inlet chamber being arranged to deliver solid material to both process chambers.
- 35 10. The process chamber of claim 2, wherein adjacent to the same wall of the furnace at least one set of chambers is provided in a manner that a process chamber is provided in the middle section of the set of chambers, and an inlet chamber is provided on both sides of the process chamber to deliver solid material to said process chamber.
11. The process chamber of claim 2, wherein adjacent to the same wall of the furnace at least one set of chambers is provided in a manner that

- a process chamber is provided in the middle section of the set of chambers, and
- an inlet chamber is provided on both sides of the process chamber, wherein

- 5 - the first inlet chamber is connected to the internal circulation of the solid material, and wherein
- the second inlet chamber is connected to the external circulation.

10 12. The process chamber of claim 2, wherein adjacent to the same wall of the furnace at least one set of chambers is provided in a manner that

- an inlet chamber is provided in the middle section of the set of chambers,

- a process chamber is provided on both sides of the inlet chamber,
 - inlets to the process chambers are provided at the lower parts of
- 15 division walls between said two process chambers and said inlet chamber, said division walls being arranged substantially in the perpendicular direction with regard to the adjacent wall of the furnace,
- said set of chambers having a common front wall arranged substantially in parallel direction with regard to the adjacent wall of the
- 20 furnace, and
- outlets of both of the process chambers in the set of the chambers are arranged to the upper part of the front wall.

25 13. The process chamber of claim 2, wherein adjacent to the same wall of the furnace at least one set of chambers is provided in a manner that

- an inlet chamber is provided in the middle section of the set of chambers,

- a process chamber is provided on both sides of the inlet chamber,
 - inlets to the process chambers are provided at the lower parts of
- 30 division walls between said two process chambers and said inlet chamber, said division walls being arranged substantially in the perpendicular direction with regard to the adjacent wall of the furnace,
- said set of chambers having a common front wall arranged substantially in parallel direction with regard to the adjacent wall of the
- 35 furnace,
- outlets of both of the process chambers in the set of the chambers are arranged to the upper part of the front wall, and

- top closed barrier walls of both of the process chambers are inclined in a manner that they are slanting towards the inlet of the inlet chamber.

5 14. The process chamber of claim 2, wherein adjacent to the same wall of the furnace at least one set of chambers is provided in a manner that
- an inlet chamber is provided in the middle section of the set of chambers

- a process chamber is provided on both sides of the inlet chamber
- inlets to the process chambers are provided at the lower parts of
10 division walls between said two process chambers and said inlet chamber, said division walls being arranged substantially in the perpendicular direction with regard to the adjacent wall of the furnace,
- said set of chambers having a common front wall arranged substantially in parallel direction with regard to the adjacent wall of the
15 furnace,

- outlets of both of the process chambers in the set of the chambers are arranged to the upper part of the front wall, and
- an outlet of the external circulation of the solid material is arranged to the adjacent wall of the furnace at the inlet of the inlet chamber.

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15. The process chamber of claim 1, wherein the rear wall of the process chamber is the said adjacent wall of the furnace of the fluidized bed reactor.

25 16. The process chamber of claim 1, wherein the process chamber is provided with a grid including means for fluidizing the interior of the process chamber by means of a fluidizing medium fed from a windbox below the grid.

30 17. The process chamber of claim 2, wherein the inlet chamber is provided with a grid including means for fluidizing the interior of the inlet chamber by means of a fluidizing medium fed from a windbox below the grid.

35 18. The process chamber of claim 13, wherein the windbox is divided into separate sections, each section having its own means for fluidizing medium feed.

19. The process chamber of claim 14, wherein the windbox is divided into separate sections, each section having its own means for fluidizing medium feed.
- 5 20. The process chamber of claim 2, wherein the inlet of at least one inlet chamber is provided with means for controlling the flow of the solid material into the inlet chamber.
- 10 21. The process chamber of claim 2, wherein the inlet of at least one inlet chamber is provided with means for controlling the flow of the solid material into the inlet chamber in a manner that the inlet of the inlet chamber is provided with a segmented area having its own fluidizing air supply means.
- 15 22. The process chamber of claim 2, wherein the inlet of at least one inlet chamber is provided with means for controlling the flow of the solid material into the inlet chamber in a manner that the inlet of the inlet chamber is provided with a segmented area having its own fluidizing air supply means, said fluidizing air supply means having a substantially U-
- 20 shaped form in a horizontal section and comprising a U-shaped tube system forming the air supply placed inside a U-shaped groove at the inlet of the inlet chamber, said tube system together with the groove reaching adjacent to both side walls and adjacent to the front wall of the inlet chamber, wherein the groove opens upwards and the direction of
- 25 fluidizing air is selected in a manner, that when the segmented area is fluidized, the solid material from internal circulation IC coming down the top closed barrier wall of the process chamber towards the inlet of the inlet chamber is forced to enter the furnace.
- 30 23. The process chamber of claim 8, wherein two sets of chambers are provided side by side adjacent to the rear wall of the reactor furnace, wherein the particle separator system in connection with the external circulation of solid material is divided to feed the flow of solid material to both sets of chambers.